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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,988	12/13/2001	James M. Florence	SLA0354	7651

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EXAMINER	
LAVARIAS, ARNEL C	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 03/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/021,988	FLORENCE, JAMES M.	
	Examiner	Art Unit	
	Arnel C. Lavarias	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2003 and 07 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/29/03 has been entered.

Drawings

2. The drawings were received on 12/13/01 as part of the original submission of the specification of the disclosure. These drawings are acceptable.

Response to Amendment

3. The amendments to Claims 1-2, 9-10, 17, 20-21 in the submission dated 12/29/03 are acknowledged and accepted.

Response to Arguments

4. The Applicant's arguments, see in particular Page 9 of Applicant's remarks, filed 12/29/03, with respect to the rejection(s) of Claim(s) 1-21 under 35 U.S.C. 102(e) and 103(a) (See in particular Sections 7-10 of the Office Action dated 7/28/03) have been

fully considered and are persuasive. Therefore, these rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of new discovered reference to Ito et al. (U.S. Patent Application Publication US2003/0179345 A1).

5. Claims 1-21 are rejected as follows.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-2, 4, 6-7, 9-11, 14, 17-18, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (U.S. Patent Application Publication US2003/0179345 A1) in view of Matsuda (U.S. Patent No. 5703861), of record.

Ito et al. discloses a polarized light beam splitter assembly (See for example Figure 16) comprising a polarized light beam splitter prism (See 10, 40 in Figure 16) in the form of a glass cube and including a first internal exposed surface (See surface on 40 attached to 210 in Figure 16) and a second internal exposed surface (See S1o in Figure 16); and a wire grid polarizer (See 211 in Figure 16) including a first surface (See surface of 210 attached to 40 in Figure 16) and a second surface (See surface on 210 attached to polarizer grid 211 in Figure 16) raised from and parallel to the first surface and including a perimeter region and a central region, the first surface of the wire grid polarizer secured

to the first internal exposed surface of the prism (See 40, 210 in Figure 16), and the second surface of the wire grid polarizer positioned next to the second internal exposed surface of the prism in the perimeter region (See 210, 10 in Figure 16) so as to define an air gap (See 212 in Figure 16) of uniform width between the second surface of the wire grid polarizer and the second internal exposed surface of the prism in the central region such that the wire grid polarizer does not contact the second internal exposed surface of the prism in the central region. Ito et al. additionally discloses the prism defining an elongate axis and wherein the first and second internal exposed surfaces are positioned at an angle in a range of one to eighty nine degrees with respect to the elongate axis (See for example line marked 'L' in Figure 16 and direction of first and second internal exposed surfaces with respect to axis 'L' in Figure 16); the second surface of the wire grid polarizer includes a wire grid thereon (See 211 on 210 in Figure 16) such that the wire grid is in communication with the air gap and such that the wire grid does not contact the second internal exposed surface of the prism in the central region; a light source positioned to emit light having a predetermined orientation (See for example 160, 170 in Figures 7, 18) to the polarized light beam splitter (See for example 110 in Figures 1, 7-8, 10, 18); and a reflection device, such as an LCD, positioned to received light redirected by the polarized light beam splitter (See for example 300 in Figures 1, 8, 10). Ito et al. lacks the second surface of the wire grid polarizer being secured to the second internal exposed surface of the prism in the perimeter region. However, Matsuda teaches an apparatus utilizing an embedded wire grid polarizer (See for example Figure 8), wherein the wire grid polarizer (See 34A, 34B in Figure 8) is secured to an exposed internal

surface of a substrate (See 31 in Figure 8) via a spacer or raised projection of solder adhesive (See rectangular spacers connecting 31 and 32 in Figure 8) so as to define a gap between a surface of the wire grid polarizer and the exposed internal surface of the beam splitter prism. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the second surface of the wire grid polarizer of the polarized light beam splitter assembly of Ito et al. be secured to the second internal exposed surface of the prism in the perimeter region, as taught by Matsuda, for the purpose of providing a fixed alignment of the prism blocks and wire grid polarizer, thus reducing alignment and light scattering losses in the polarized light beam splitter assembly.

8. Claims 3, 5, 13, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. in view of Matsuda as applied to Claims 1-2, 10, 17 above, and further in view of Yamada et al. (U.S. patent No. 6013339), of record.

Ito et al. in view of Matsuda discloses the invention as set forth above in Claims 1-2, 10, 17, except for the spacers being distributed with an adhesive that secures the second surface of the wire grid polarizer to the second internal exposed surface of the prism, wherein the spacers define a rigid sphere, and wherein the height of the spacers is equal to the diameter of the rigid spheres. However, Yamada et al. teaches that spacers may be used in the periphery of the device to attach the substrates together and to form the internal gap, and that the spacers may be in the form of rigid glass beads, all of uniform diameters to provide a gap of uniform thickness (See 2 in Figure 5; col. 10, lines 54-64). Therefore, it would have been obvious to one having ordinary skill in the art at the time

the invention was made to have the spacers be distributed with an adhesive that secures the second surface of the wire grid polarizer to the second internal exposed surface of the prism, wherein the spacers define a rigid sphere, and wherein the height of the spacers is equal to the diameter of the rigid spheres, as taught by Yamada et al., in the polarized light beam splitter assembly of Ito et al. in view of Matsuda, for the purpose of sealing and protecting the wire grid polarizer, as well as provide a uniform thickness spacing between the wire grid polarizer and the exposed internal surface of the beam splitter prism.

9. Claim 8, 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. in view of Matsuda as applied to Claims 1, 7, and 10 above, and further in view of Perkins et al. (U.S. Patent No. 6288840), of record.

Ito et al. in view of Matsuda discloses the invention as set forth above in Claims 1, 7, and 10, except for the first and second internal exposed surfaces being positioned at an angle in a range of forty to fifty degrees with respect to the elongate axis. However, it is well known in the art to dispose wire grid polarizer elements along the diagonal of a cube prism, the diagonal of the cube prism forming approximately a forty five degree angle with an axis of propagation normal to a face of the cube prism. For example, Perkins et al. teaches a polarized light beam splitter defining an elongate axis (See axis defined either by 63 or 65 in Figure 10) and the embedded wire grid polarizer being positioned at an angle of approximately 45 degrees with respect to the elongate axis (Note that with respect to either elongate axis as defined, 61 lies on the long diagonal of the cube, and is thus at an angle of approximately 45 degrees from either elongate axis). Therefore, it

would have been obvious to one having ordinary skill in the art at the time the invention was made to have the first and second internal exposed surfaces be positioned at an angle in a range of forty to fifty degrees with respect to the elongate axis, as taught by Perkins et al., in the polarized light beam splitter assembly of Ito et al. in view of Matsuda, for the purpose of simplifying the alignment of the input and output light beams.

10. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. in view of Matsuda.

Ito et al. in view of Matsuda discloses the invention as set forth above in Claims 1 and 10, except for the air gap having a width in the range of one to thirty μm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the width of the air gap to be in the range of one to thirty μm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to have the air gap have a width in the range of one to thirty μm for the purpose of reducing fabrication costs (since larger air gap widths require a spacer with an appropriately larger thickness or diameter) while providing a controlled air gap spacing. *In re Aller*, 220 F.2d 618, 195 USPQ 6 (CCPA 1977). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent Application Publication US2003/0117708 A1 to Kane; U.S. Patent Application Publication US2003/0228759 A1 to Uehara et al.; U.S. Patent Application Publication US2003/0186131 A1 to Enloe; U.S. Patent Application Publication US2004/0008416 A1 to Okuno; U.S. Patent Application Publication US2003/0210379 A1 to Magarill et al.

The above references are being cited to evidence polarized light beam splitter assemblies very similar to that of the instant invention. However, these references are not available as prior art because of the effective filing date of the instant application.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Arnel C. Lavarias
3/10/04

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